SOCIETIES AND ACADEMIES

LONDON

Mathematical Society, Dec. 12.—Dr. Hirst, F.R.S., president, in the chair, Prof Cayley read a paper "On the mechanical description of certain quartic curves by a modified oval chuck," and exhibited the action of the instrument. Mr. S. Roberts spoke on the subject of the paper. —Prof. Cayley then gave an account of his communication "On geodesic lines, especially those of a hyperboloid."—Mr. J. J. Walker made a few remarks on the breaking up of the anharmonic Ratio Sextic—Mr. J. W. L. Glaisher next gave a description, and worked out part, of his paper "On a deduction from Von Stavdt's property of Bernoulli's numbers."—Prof. Clifford read a paper, "Geometry on an Ellipsoid."

Linnean Society, Dec. 5.—Mr. G. Bentham, president, in the chair.—On the skeleton of the *Apteryx*, by Thos. Allis.—On new and rare British Spiders, by the Rev. O. P. Cambridge.

Dec. 19.—Mr. W. G. Smith exhibited a fine specimen of *Batarrea phalloides* (one of four specimens found in the grounds of the Earl of Egmont, near Epsom), and read a brief paper thereon, in which he commented on the great rarity of the plant and the peculiarity of its form. Mr. Smith gave some details of its structure, especially as regards its possession of so-called spiral vessels, and referred to its position among other fungi, especially the genera *Clathrus*, *Phallus*, *Cynophallus*, and *Geaster*, a complete set of drawings of these genera, showing every stage of growth, being exhibited to the meeting.—On the development of the flowers of *Welwitschia mirabilis*, by W. R. M'Nab. These investigations were made on a beautiful series of flowers of both sexes forwarded by Dr. Hooker, whose previous paper was based on the examination only of immature specimens. Prof. M'Nab's conclusions differed in some respects from those of Dr. Hooker. He believes the male and female flowers to be constructed on a different plan. In the female flower the ovule is truly naked, what has been taken by some to be the carpel being in reality the integument of the ovule. In the male flower, on the other hand, the (rudimentary) ovule has a true carpellary coating. In the male flowers, therefore, *Welwitschia* shows a close approximation to Angiosperms. Several other points in the structure and development of this remarkable plant were exhaustively gone into.—On the General Principles of Plant Construction, by Dr. M. T. Masters, F.R.S. The chief objects of this suggestive paper were to attempt to introduce greater exactness into botanical terminology, the definition of parts and organs according to their morphological rather than their external significance, and to frame a classification of the facts of morphology in accordance with our present knowledge of the laws of development.

Geologists' Association, Dec. 6.—The Rev. T. Wiltshire, M.A., president, in the chair.—"On coal seams in the Permian at Ifton, Shrpshire, with remarks on the supposed glacial climate of the Permian period," by D. C. Davies, F.G.S. The author showed the existence of three well-defined and workable seams of coal *above* the red sandstones and marls which are generally held to form the base of the Permian strata. He then proceeded to show the identity of these red beds with similar beds overlying the coal throughout several of the Midland Counties, and with the red sandstones of the North of England, and also that the overlying sandstones, shales, and coals were the equivalent of the magnesian limestones and calcareous conglomerates which occupy the same horizon in widely distant places. After referring to the former probable extension of these beds over a large area, the author pointed out that in the neighbourhood described the gap or break which is usually supposed to occur between the Coal Measures and the Permian was partly, if not quite, bridged over. He also noticed how the different geological formations were dovetailed into each other, the old passing upward into the new, and not divided by sharp, well-defined lines. From the identity of the age of these coal seams with the Permian conglomerate of Alberbury only fifteen miles distant, he questioned the probability of that conglomerate being of glacial origin, since two climates so dissimilar as a glacial one and that in which a carboniferous flora flourished could not exist together within so limited an area, In conclusion, Mr. Davies pointed out the necessity for alterations of the boundaries of the Permian and the coal measures in any future geological maps of the district.—Note "On a well section at Finchley," by Caleb Evans, F.G.S.

Entomological Society, Dec. 2.—Prof. Westwood, F.LS., president, in the chair.—Prof. Westwood exhibited a drawing of a variety of *Pyrameis cardui* captured many years since on Margate sands.—Mr. Bond exhibited several curious varieties of British Lepidoptera, including a female *Lycæa ægon*, the wings of which on one side were coloured as in the male, *Acronycta megacephala*, &c. He also exhibited *Anomalon fasciatum*, a species of *Ichneumonidæ* new to Britain, bred by Mr. Mitford from the larvæ of a supposed variety of *Lasiocampa trifolii*.—Mr. F. Smith, in answer to a question put to him by Major Mann, as to whether queen-bees sting, stated that he had never been stung by one, and Prof. Westwood said that was also his experience.—Mr. Champion exhibited *Thyamis distinguenda* Rye, and *Lithocaris picea* Kraatz, two species of beetles recently detected in Britain. Mr. Müller read notes on the manner in which the ravages of a species of *Nematus* or *Salix cinerea* are checked by *Picromerus bidens* L.—Mr. Dunning read supplementary notes on the genus *Acentropus*.—Mr. Baly sent the first portion of a catalogue of the phytophagous *Coleoptera* of Japan, partly drawn up from materials collected by Mr. George Lewis.—Mr. F. Bates communicated descriptions of new species of *Tenebrionidæ*.—Mr. R. Trimen sent descriptions of new South African butterflies.

Photographic Society, Dec. 10.—James Glaisher, F.R.S. president, in the chair.—A paper was read on landscape photography by F. C. Earl, in which that gentleman detailed his method of photographing large landscapes. Lenses of different focal length, but covering the same extent of field, were employed in the camera, so that foreground, middle distance, or horizon might be rendered more or less prominent at will.—Mr. J. R. Johnson read a paper on a new actinometer recently invented by Mr. Burton, the translucent films of which were formed by bichromate films, coloured with pure Indian-ink; the scales were arranged in true geometrical progression.—Mr. George Croughton read a paper on mezzotint effects.

Royal Microscopical Society, Dec. 4.—W. Kitchen Parker, F.R.S., president, in the chair. A new form of micro-spectroscope was described by Edward Gayer, Surgeon of H.M. Indian Army. Mr. Gayer claims for his invention the following advantages, more light, more dispersive powers, and the possibility of using it even with high powers.—Dr. Royston Pigott drew attention to a new method of using the micrometer.—The President read a paper "On the Histology and Growth of the Skull of the Tit and Sparrow Hawk."

EDINBURGH

Royal Physical Society, Nov. 27.—Mr. Charles Williams Peach, one of the presidents of the society, delivered an opening address, his subject being "The Fossil Flora of the Old Red Sandstone of the North of Scotland." The history of the Old Red sandstone, he said, whether of its rocks, plants, or fishes, was still to be written. Slowly light was breaking in upon the organisms found in the formation; but much inquiry and search required yet to be made before a full catalogue of these could be drawn up. Not long ago it was believed that the only organisms to be found in the Old Red sandstone were of a marine character, such as fucoids, but he ventured to say that the flora of the formation was not so poor as was supposed. He had investigated the Old Red, particularly in the north of Scotland, and found many land plants. They were rarely to be found in beds of limestone, seldom or never in the pavement beds of commerce, but were far from rare in the coarse beds that underlie the last-named. He believed that if these coarse beds were exposed a perfect forest of plants would be discovered. The state of knowledge of the fossilliferous character of the Old Red sandstone stood thus:—In 1844 land plants were *nil*, fucoids abundant; 1849, of land plants, one genus and one species; fucoids as many as you please; 1855, five genera of land plants and five species; fucoids abundant; 1872, thirteen genera and twenty-three species of land plants; sea-weeds *nil*.

Edinburgh Naturalists' Field Club, Nov. 29.—Mr. R. Scott-Skirving, president, in the chair.—The secretary, Mr. J. D. Brown, read the annual report, which stated that during the year the club had had twenty-three excursions. The secretary of the Largo Field Society offered a prize—of fifty mounted specimens of *Musci Fifenses*, to be competed for by ladies present at the club's excursions to Kilconquhar and Elie. This prize was gained by Miss Masson. Two additional prizes were offered by two members of the club, to be competed for by the ladies—one at North

Berwick and the other at Linlithgow. The total membership of the club was seventy-eight, showing an increase of eight over last year.

CAMBRIDGE

Philosophical Society, Nov. 25—On the appearance of an extra digit on the hind limbs and then on both fore and hind limbs in two successive generations, and its bearing on the theory of Pangenesis, by Mr. N. Goodman. A cow had three well-developed toes on each hind limb, besides the two ordinary rudiments. Her calf (by a normal bull) had the same peculiarity. This has two calves (by normal bulls). The first, a cow, had the toes as in the other cases, but rather less developed; the second, a bull, had three toes on all four feet. The writer pointed out that this peculiarity might be explained by (1) atavism, (2) certain modifications of the proliferous function by external causes (3) correlation of growth, supplementing the former. He thought it could not be explained by atavism, nor by the second cause, but by the third, and discussed its bearing on his theory of Pangenesis.—A communication was received from Mr. W. H. Stanley on a Pneumatical design for saving life at sea. The process was by the expansion of condensed air stored in reservoirs.

LEEDS

Naturalists' Field Club and Scientific Association, Nov. 26.—Mr. J. W. Taylor on behalf of Mr. W. Nelson, of Birmingham, read a paper on "The Lymnæidæ of the Birmingham district," giving a catalogue of nineteen species found within five miles of Birmingham, against the twenty-three at present included in the British fauna. He also recorded twenty-four varieties for that district. The absence of the remaining four species was readily accounted for, on the ground either of their extreme rarity, or of their recent introduction into these islands. *Planorbis dilatatus* has recently been imported along with cotton; *Lymnæa involuta* has never been found away from its original locality, Killarney; while *Planorbis lacustris* and *Lymnæa glutinosa* are excessively rare. The following is a list of the nineteen species found within five miles of Birmingham. *Planorbis nitidus*, *P. nautileus*, *P. albus*, *P. glaber*, *P. spirorbis*, *P. vortex*, *P. carinatus*, *P. complanatus*, *P. corneus*, *Physa hypnorum*, *P. fontinalis*, *Lymnæa peregra*, *L. auricularia*, *L. stagnalis*, *L. palustris*, *L. truncatula*, *L. glabra*, *Ancylus fluviatilis*, *A. lacustris*.

RIGA

Society of Naturalists, Jan. 24 (Feb. 5, N.S.)—M. C. Berg noticed the damage done to some peas by the larva of *Endrosis lacteella*.—M. Gögginger called attention to a yellow lucerne, identified by him with *Medicago media*, which he found near Hapsal, and recommended for cultivation, especially on account of its deep roots. Dr. Buhse doubted the identification of the plant, and stated that *Medicago media* is a hybrid of *M. sativa* and *falcata*, and that when cultivated it reverts to the type of the former species in a few years.—The aurora of February 4 was referred to by M. Schroeder and Prof. Schell. The former found no traces of polarisation, but in the spectroscope a broad greenish yellow line made its appearance. Prof. Schell's paper included notices of the phenomenon from various sources.

February 7 (19 N.S.)—Dr. Nauck exhibited and described a maximum and minimum thermometer constructed on a new principle. It is a U-shaped tube, having one upright limb terminating in a bulb, and the other bent inwards and then downwards into a large cylindrical portion. The lower part of the U-tube is filled with mercury, and the rest with alcohol, except the bulb of the upright tube, the greater part of which is empty. The floats are of glass, enclosing an iron wire, and are fixed in the tubes by means of bent human hairs.—Dr. Buhse gave a detailed description of the parasitic fungi of infectious diseases, in which he referred to those affecting plants, animals, and man, and especially noticed the relation of *Bacteriæ* to disease.

February 21 (March 4, N.S.)—M. Schroeder announced that two days previously (March 2, n.s.) he observed a distinct zodiacal-light about 8 o'clock P.M.—M. Frederking read a second part of his memoir on the History of Chemistry, in which he referred first to the discovery of oxygen by Priestley and Scheele, and then passed to the consideration of Lavoisier's labours.

February 28 (March 11, N.S.)—M. H. Westermann reported upon a work by Fechner entitled "Experimental Æsthetics," in which the author endeavours to investigate experimentally the general principles of symmetry. This report presents some curious and interesting points; the questions raised by it were discussed by several of the members present.

GOTTINGEN

Royal Society of Sciences, Aug. 3.—M. G. Meissner communicated a paper by Dr. Hartwig on the passage of substances from the blood of the mother into the fœtus, in which he showed, in opposition to Gusserow, that iodine administered in solution to the parent speedily passes into the fœtus.—M. Felix Kleim presented a contribution towards the interpretation of complex elements in geometry.—M. H. Hübner presented a paper by M. G. Spezia on the determination of iodine in the presence of chlorine, by means of protonitrate of thallium. This process is founded on the fact that whilst chloride of thallium is soluble in a large quantity of water, iodide of thallium is insoluble.—M. Wilhelm Weber communicated a paper by M. E. Riecke on the law of electro-organic reciprocal actions proposed by Helmholtz.—M. Clebsch exhibited and described two models prepared by M. Weiler, and relating to a particular class of surfaces of the third order.

Sept. 18.—M. A. Clebsch read a paper on a new fundamental form of the analytical geometry of planes.

Sept. 25.—M. F. Kohlrausch presented a paper on the electromotive power of very thin strata of gas upon metal plates.

Oct. 9.—M. A. Clebsch communicated a paper by M. A. Mayer on Lie's method of integration of the partial differential equations of the first order.

Oct. 30.—M. A. Clebsch communicated a long contribution by M. Sophus Lie to the theory of partial differential equations of the first order, and on their classification.

Nov. 13.—M. A. Clebsch presented a note by M. H. Grassmann on the theory of curves of the third order.—M. Weber communicated a paper by M. E. Reicke on the magnetisation-function of a sphere of soft iron.—Prof. Henle presented a note by M. Oscar Grimm on the olfactory organ of the sturgeon, in which the author describes certain peculiar cells which occur on the surface of the olfactory grooves.—M. Oscar Grimm also forwarded a note on *Synura uvella* and *Uroglena volvox*, belonging to Häckel's Protistan group of the Catallacta, indicating a probable genetic connection of the Catallacta with the sponges.

VIENNA

Imperial Academy of Sciences, Oct. 10.—The completed MS. of a catalogue of observed Polar lights was forwarded by Dr. Herrmann Fritz of Zürich. Prof. Hlasiwetz communicated a memoir by Dr. F. Hinterberger on excretine. The substance was prepared by the author from fresh human excrement, and found to be free from sulphur and with the formula $C^{20} H^{36} O$. With bromine it forms bibromexcretine, with the formula $C^{20} H^{34} Br^2 O$.—Dr. Kretschmar presented a memoir on the influence of morphine, and carbonate and sulphate of soda in *diabetes mellitus*. The first-mentioned substance acted beneficially, and reduced the secretion of sugar to zero.—Prof. L. Boltzmann communicated two memoirs, one containing further investigations on the heat-equilibrium among gaseous molecules, the other an experimental investigation on the behaviour of non-conducting bodies under the influence of electrical forces.

October 17.—M. Otto Hermann presented a memoir entitled "The Noble Siebenburgian Horse," intended to correct statements in Dr. L. J. Fitzinger's essay on the origin of the domestic horse and its races.—Prof. E. Mach, of Prague, communicated a memoir on the stroboscopic determination of musical notes. His stroboscopic scale is a uniformly rotating white cylinder covered with black longitudinal streaks, the closeness and number of which rapidly increases from one end of the cylinder to the other. This is observed through radiating fissures in a paper disc attached to the axis of the sirène, and the streaks are always seen simple at the spot where they pass before the eye in the vibration-number of the sirène.—The same author forwarded two papers prepared by him in conjunction with Dr. J. Kessel. In the first of these, on the function of the tympanic cavity and of the eustachian tube, the authors show by experiment, not only that the tuba is usually closed, but that this closure is necessary for the production of effective vibrations of the tympanic membrane. In the second they treat of the accommodation of the ear, and show that, although alterations of the tension of the *tensor tympani* may cause a limited accommodation, such alterations do not occur in the living ear during hearing and listening.

October 24.—Prof. L. Gegenbaur, of Krems, communicated a memoir entitled "Integral Expressions for the Functions Y^m_n." Dr. Peyritsch presented a memoir on Peloric formations, in which he described the types of pelorism in the Labiatæ, Verbenaceæ, Scrophulariaceæ, and Ranunculaceæ, and endeavoured to show the probability that in the Labiatæ we have to do with a quaternary and not with a quinary type.

PHILADELPHIA

Academy of Natural Sciences, May 28.—Professor Cope exhibited some vertebræ of a Plesiosauroid reptile and also those of a smaller species, probably a *Clidastes* which were found in close proximity near Sheridan, Kansas, by Mr. Joseph Savage, of Leavenworth. According to this gentleman, the vertebral column of the *Clidastes* was found immediately below that of the Plesiosauroid and in a reversed position, as though it had been swallowed by the latter or larger reptile. The largest vertebræ of the *Clidastes* were about three-quarters the length and one-fourth the diameter of those of the Plesiosauroid, and the animal must have furnished a large, or at least a long, mouthful for its captor. The bones of the *Clidastes* were not in good condition, but resembled those of *C. cineriarum* Cope, though smaller. The Plesiosauroid was new to science, being the third species discovered in the Cretaceous of the Niobrara group. Specifically it was nearest to the *Elasmosaurus platyurus* Cope, but was readily distinguished by the relatively shorter cervical vertebræ, and the regular acute ridges on the exterior surfaces near the margin of the articular faces, as well as the less contracted form of all the vertebral centra. Associated with these remains were those of a turtle of the size of some of the large *Chelonidæ* of recent seas. The only portions were the scapulo-procoracoid, the coracoid, and the mandible nearly complete. The general characters of this form were thought to agree with *Cynocercus* Cope, though the individual was larger than that on which the *C. incisus* was established.

June 4.—Mr. Thomas Meehan presented some specimens of the common asparagus, and remarked that in consequence of observing last year so many plants that had evidently flowered producing no seeds, he had this year examined them in a flowering condition and found them perfectly diœcious. Imperfect stamens existed in the female flowers, but they were never polleniferous. An occasional gynœcium in the male flower would make a weak attempt to produce a pistil, but no polleniferous flower ever produces a fruit. There was a great difference in the form of the male and female flowers. The former were double the length of the latter, and nearly cylindrical, while the female flower was rather campanulate. Other observers had nearly made the discovery of division in this plant. The old "English Botany" of Smith gave it the character of being occasionally imperfect, and the authors of "Deutchland's Flora" considered it as occasionally polygamous. But Mr. Meehan was satisfied from a half day's investigation among many plants that in this region at least the asparagus is never perfect, but truly diœcious. He had observed another matter, small, but which might be of importance to systematic botanists, as well as to those engaged in evolutionary studies. One flower had a quadrifid stigma, and a four-celled ovary. The trinate type, or its multiple, is so closely associated with the endogenous structure, that he considered this circumstance particularly worthy of note. The male flowers seem very attractive to insects, various kinds of which seem to feed on the pollen. The honey bee was a frequent visitor. None seemed to be attracted to the female flowers. In the division into separate sexes the plant had gained nothing in the way of aid by insect fertilisation. Fertilisation seemed wholly accomplished by the wind. The male flowers are produced in much greater abundance than the female ones. Mr. Meehan added that this discovery had a more than usual practical importance. Many attempts had been made to improve the asparagus, as garden vegetables and the farm cereals had been improved; but it had often been questioned whether these improved forms would reproduce themselves from seed as other garden varieties did. The tendency of thought the few past years had been in the direction of the belief that permanent varieties could be raised, and several improved kinds had been sent out by seedsmen, and were popular to a considerable extent. He said he had himself inclined to this opinion; but this discovery of complete diœcism in asparagus, whereby two distinct individual forms were required to produce seed, rendered a true reproduction of one original parent impossible, as the progeny must necessarily partake of both forms.

"On the Fishes of the Ambyiacu River," by Edward D. Cope. The collection on which the present examination is based was made by our correspondent at Pebas, John Hauxwell. It embraces fishes of the small streams tributary to the Ambyiacu, as well as those of the river itself. The Ambyiacu is an inconsiderable river, which empties into the Amazon near to Pebas, in Eastern Equador, some distance east of the Napo. The results of the examination will be mentioned at the close of the list. As was to have been supposed, it consists almost exclusively of representatives of the three great families which abound in the neotropical region; the *Chromididæ*, representing Physoclystous fishes, and the *Characinidæ* and *Siluridæ*, representing the Physostomi. The number of new species, 45 in a total of 74, constitutes a considerable addition to ichthyology, especially as the number of new generic forms is also rather large. The author adds a list of the species obtained by Robert Perkins, of Wilmington, Delaware, on a trip between the mouth of the Rio Negro and the Peruvian Amazon or Ucayale River. There are several interesting novelties in this collection, but their special localities are, unfortunately, not preserved. The specimens generally were large, and in fine condition.

BOOKS RECEIVED

English.—A Budget of Paradoxes: A. De Morgan (Longmans).—Physics and Politics: W. Bagehot (H. S. King and Co).—Grotesque Animals: E. W. Cooke (Longmans)—Owens College Junior Course of Practical Chemistry: Roscoe and Jones (Macmillan).—The Hygiene of Air and Water: W. Procter (Hardwicke).

PAMPHLETS RECEIVED

English.—The General Glaciation of Jar-Connaught and its Neighbourhood: Kinahan and Close.—Proceedings of the Geologists' Association, Vol. ii., No 7.—Razi: W. Soleman—Ninth Report of the Belfast Naturalists' Field Club.—The Curability of Cancer, 2nd edition—Introductory Lecture on Geology: E Wilson—The Examination Questions in Geology, with answers—Transactions of the Institute of Engineers.—Annual Report of Vigilance Association.—A Catalogue of a Collection of Models of Ruled Surfaces, constructed by M. F. de Lagrange.—Journal of Anatomy and Physiology, No 2.—Weather Report of the Meteorological Office, January-March, 1872—Transactions of the Clifton College Scientific Society, Part 3—Journal of the Society of Telegraphic Engineers, No. 1.—Report of the Lower Mosely Street School Natural History Society.—Ocean Highways, Parts 1, 2—A Table of the relative value of different Articles of Food: C. Ekin—The Advantages of Gas for cooking and heating: M. Ohren—Twelve Months' Experience with the A B.C. Process of Purifying Sewage: W. Crookes.—Provident Knowledge Papers, Nos. 1-12.

American and Colonial.—Canadian Naturalist, vol. iv., Nos. 9-10.—New Remedies: H. J. Wood, vol. ii, No. 2.—The Birds of Florida: C. J. Maynard, No. 1.—Proceedings of the American Philosophical Society, January-June, 1871.—Deductive and Inductive Training: B. Silliman.—The Australian Mechanic, Nos. 8 and 9—Indiana Journal of Medicine for September—Lippincott's Magazine for November.—Proceedings of the Asiatic Society of Bengal for August.

Foreign.—Sitzungsb. der geologischen Reichsanstalt zu Wien. No. 13.—Zeitschrift für Meteorologie, Nos. 20-23.—Zeitschrift für Ethnologie, No. 21.—Le Physiometre: P. Harting.—Ofversigt af kongl. Vetenskaps Akad. Forhandlinger.—Bulletin de l'Acadèmie Royale de Belgique, Nos. 9 and 10. Sitzungsb. der k. k. Akad der Wiss. zu Wien, Nos. 24, 25.—Bulletin de la Société de Geographie de Paris, September.

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ERRATA.—No. 159, p. 28, col. 1, line 8 from bottom, for "microscope" read "spectroscope;" col. 2, lines 16-19 from bottom, for "an absolute" read "one, absolute," and for "impossible" read "improbable."